CLAIMS

1. A method for manufacturing a camshaft in which at least two completely machined individual cams (1, 2, 4) are fixedly mounted on a shaft in predetermined angular positions, whereby the shaft may consist in particular of an outside shaft (12) and an inside shaft (11) arranged concentrically inside the former,

characterized by the following manufacturing steps, to be performed in chronological order:

- the at least two cams (1, 2, 4) to be detachably mounted on the shaft (11; 12) are combined to form a machining module before being mounted on the shaft, whereby the first cams (1, 2) which are immovable with respect to one another on the finished camshaft are aligned in an arrangement corresponding to the final arrangement on the shaft (11; 12),
- at least the cam contours of the at least two cams (1, 2, 4) are completely machined within the machining module from the radial peripheral surfaces of the cams,
- the completely machined cams (1, 2, 4) are mounted on the shaft (11; 12) within the machining module,
- the first cams (1, 2) which are immovable with respect to one another on the finished camshaft are fixedly connected to the shaft (11; 12) in their arrangement within the machining module that is fixedly defined at least with regard to their angular position,
- the detachable joining of the cams (1, 2, 4) within the machining module is separated, whereupon positioning means and/or auxiliary connecting means (3, 5) that may optionally be used within the machining module are removed.

2. The method for manufacturing a camshaft on which the cams (1, 2, 4) to be mounted are spaced an axial distance apart, according to Claim 1,
characterized in that
such axial spacings in the machining module are set by the spacers (3) used there.

3. The method according to Claim 1 or 2,
characterized in that
the spacers (3) as components that are open at the circumference are provided with an opening larger than the respective outside diameter of the shaft occupied by the cams, whereby this is true with regard to the outside diameter of the outside shaft (12) in the case of a shaft composed of an inside shaft (11) and an outside shaft (12).

4. The method according to any one of the preceding claims, in which one of the cams (1, 2, 4), namely a second cam (4) has a radial fitting borehole (7) to receive a fastening element (13) which secures this second cam (4) on the inside shaft (12),
characterized in that
the fitting borehole (7) is created while the respective second cam (4) is within the machining module.

5. The method according to any one of the preceding claims, characterized in that screws (5) which pass axially through the cams (1, 2, 4) serve as the means for producing the detachable joining.

6. The method according to any one of the preceding claims, characterized in that at least two screws (5) are distributed over the circumference of the cams (1, 2, 4).

7. The method according to any one of the preceding claims,
characterized by the features
- a thread (6) of a screw (5) engages in a mating thread which is provided in a spacer (3) situated at a distance from the screw head,
- at least two screws (5) are inserted in opposite directions axially with regard to the position of their heads and threads.

8. The method according to any one of the preceding claims,
characterized in that
axial dowel pins are used as positioning means inside the machining module.

9. The method according to any one of Claims 1 through 7,

characterized in that
the screws (5) are designed as fitting screws.

10. The method according to any one of the preceding claims for manufacturing a camshaft in which the shaft on which the cams (1, 2, 4) are mounted is made of two shafts that are adjustable in relation to one another and are situated concentrically one inside the other, namely an inside shaft (11) and an outside shaft (12) and first cams (1, 2) are fixedly connected to the outside shaft (12) and second cams (4) are fixedly connected to the inside shaft (11) via radial connecting elements (13) which pass through the outside shaft (12),
characterized in that
- the machining of the radial inside surfaces for all cams (1, 2, 4) is performed for all cams to the same diameter and
- a recess (9) having a reduced diameter is provided on the outside shaft (12) for receiving

the second cam (4), whereby the reduction is of such an extent that play-free rotation of the second cam (4) on the outside shaft (12) is ensured.